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ABSTRACT

Volume 18 of the 19-volume Highway Safety Program Manual (which provides guidance to State and local governments on preferred highway safety practices) concentrates on accident investigation and reporting. The purpose and objectives of an investigation and reporting program are outlined. Federal authority in the area of highway safety and policies regarding an accident investigation and reporting program are explained. Program development and operation (administration, accident reporting, owner and driver reports, police accident investigation, and investigation by State accident investigation teams) are presented. Criteria for program evaluation and different types of reports (operational, management information, and National Highway Traffic Safety Administration) are explained. Local government participation is outlined. Appendixes contain the Highway Safety Program Standard 18, Accident Investigation and Reporting; a glossary of definitions; a list of minimum information required on driver-reported accidents; references; a list of representative projects; a list of resource organizations; an explanation of accident causes and contributing factors; a program matrix for highway safety research; a list of sources of uniform definitions and classifications; and a checklist for program evaluation. (NH)

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Program Manual

Accident Investigation and Reporting

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U.S. DEPARTMENT
OF TRANSPORTATION

NATIONAL HIGHWAY TRAFFIC
SAFETY ADMINISTRATION

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HIGHWAY SAFETY PROGRAM MANUAL

VOLUME 18

ACCIDENT INVESTIGATION AND REPORTING

This manual is designed as a guide for States and their political subdivisions to use in developing highway safety program policies and procedures. It does not supersede the requirements of Highway Safety Program Standard No. 18.

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FOREWORD

As part of the Highway Safety Program Manual, this volume is designed to provide guidance to State and local governments on preferred highway safety practices. Volumes comprising this Manual are

0. Planning and Administration
1. Periodic Motor Vehicle Inspection
2. Motor Vehicle Registration
3. Motorcycle Safety
4. Driver Education
5. Driver Licensing
6. Codes and Laws
7. Traffic Courts
8. Alcohol in Relation to Highway Safety
9. Identification and Surveillance of Accident Locations
10. Traffic Records
11. Emergency Medical Services
12. Highway Design, Construction, and Maintenance
13. Traffic Engineering Services
14. Pedestrian Safety
15. Police Traffic Services
16. Debris Hazard Control and Cleanup
17. Pupil Transportation Safety
18. Accident Investigation and Reporting

The volumes of the Manual supplement the Highway Safety Program Standards and present additional information to assist State and local agencies in implementing their highway safety programs.

The content of the volumes is based on the best knowledge currently available. As research and operating experience provide new insights and information, the Manual will be updated.

The volumes of the Highway Safety Program Manual deal with preferred highway safety practice and in no way commit the Department of Transportation to funding any particular program or project.

Many expert organizations and individuals at all levels of government and in the private sector contributed to the preparation of the volumes in the Manual. The Department appreciates greatly this help in furthering the national program for improving highway safety for all Americans.

U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

HIGHWAY SAFETY PROGRAM MANUAL

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I. INTRODUCTION

A. Government agencies at all levels meet the responsibility for safety on the highway transportation system through various programs of control, such as motor vehicle inspection, driver standards, traffic law enforcement, uniform traffic control devices, highway design standards, and motor vehicle safety regulations.

B. Each agency needs information to plan, implement, and evaluate the effectiveness of its program, and to identify new requirements. Common to all programs is the need for factual information on the "who, what, when, where, why, and how" on motor vehicle traffic accidents. Such data are acquired through uniform accident investigation procedures and systematically entered into an efficient traffic records system. They provide the basic means for identifying and understanding accident and injury causation.

The various government agencies then have the objective tools needed to measure the magnitude and identify characteristics of the problem, determine needed legislation, allocate resources to accident prevention programs, plan research, and evaluate ongoing activities in terms of reductions in deaths, injury, and property damage.

C. The importance of accident investigation has been expressed in at least two Congressional reports.

The House of Representatives report states

> "The most efficient computerized record system that can be devised will be only as good as the accident investigation that supplies it with raw data, . . .
>
> ". . . Uniform, complete, and accurate accident reports . . . can tell us not only how many accidents we have, but what kind of accidents they are, where and when they occur, the physical circumstances and the people, and the injuries and death and damage they involve, what emergency services and enforcement agencies responded, and how and what judicial action resulted. . . . This information, at both the State and Federal level, can help us to determine which safety program elements need strengthening and which ones are good prospects for productive expansion. It can be useful for education, licensing, traffic engineering, highway design and maintenance, vehicle inspection, traffic surveillance, and virtually every other aspect of highway safety.
>
> ". . . we are capable of putting at the scene of our accidents personnel who are capable of examining all the factors involved, so that the accident investigation will be comprehensive and meaningful. Only in this way, too, will we learn what elements contribute to injuries and deaths, and how these can be alleviated and prevented."*

The Senate Report states

> "Accident investigation is also important to determine both immediate and underlying causes in furtherance of the accident investigation program. Thus, methodology and personnel for trained and skilled accident study teams, for prompt selection and extended investigation of accidents, need to be developed."**

*H. Rept. 1700, 89th Congress, 2d Session, pp. 10, 11.
**S. Rept. 1302, 89th Congress, 2d Session, p. 15.

II. PURPOSE

The purpose of this Accident Investigation and Reporting Standard is to establish a uniform, comprehensive motor vehicle traffic accident investigation program for

A. Gathering information—who, what, when, where, why, and how—on motor vehicle traffic accidents and associated deaths, injuries, and property damage.

B. Entering the information into the traffic records system for use in planning, evaluating, and furthering highway safety program goals.*

III. SPECIFIC OBJECTIVES

The specific objectives of the program are to

A. Determine the accident data needs of enforcement agencies, traffic, highway, and automotive engineers, educators, licensing authorities, medical, and other groups and organizations having a responsibility for highway safety. Such data should be consistent with each organization's mission.

B. Develop and implement procedures to gather required data as determined in "A" above.

C. Specify routine data requirements and the forms used to record data and transmit it to the data storage facility.

D. Assure that the data gathered are accurate, uniformly described, and compatible with requirements of the system.

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*Motor vehicle crash data is one of four major divisions of data provided to the State traffic records systems. The other data sources are Driver, Vehicles, and Highways. See Highway Safety Program Standard No. 10, Traffic Records.

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Par. I. Authority
II. Standard

I. AUTHORITY

The authority for the Highway Safety Program is vested in the Secretary of Transportation in accordance with Chapter 4 of Title 23, U.S.C (hereinafter referred to as the Highway Safety Act of 1966). Section 402(a) states that

> "Each State shall have a highway safety program approved by the Secretary, designed to reduce traffic accidents and deaths, injuries, and property damage resulting therefrom. Such programs shall be in accordance with uniform standards promulgated by the Secretary. . . . In addition such uniform standards shall include, but not be limited to, provisions for an effective record system of accidents (including injuries and deaths resulting therefrom), accident investigations to determine the probable causes of accidents, injuries, and deaths. . ."

II. STANDARD

Pursuant to the requirements of the Highway Safety Act of 1966, the Secretary issued Highway Safety Program Standard 18, entitled Accident Investigation and Reporting. The Standard appears as Appendix A of this volume.

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III. Specific Policies

I. INTRODUCTION

The intent of the Highway Safety Act of 1966 is to promote highway safety through the implementation by the States of uniform Highway Safety Standards. The Department of Transportation has the responsibility for issuing these standards and assisting the States in their implementation.

II. GENERAL POLICY

The general policy of the Department of Transportation is to encourage and support each State in the development and implementation of an accident investigation and reporting program* designed to accomplish the objectives stated in Chapter I of this Manual.

III. SPECIFIC POLICIES

Within the general policy as stated above, the following specific policies apply:

A. Each State shall have one agency with primary responsibility for the accident investigation and reporting program.

*Program in this volume means the statewide program concerning accident investigation and reporting.

B. National uniform definitions and classifications approved by the National Highway Traffic Safety Administration shall be an integral part of each program.

C. States are encouraged to exchange significant conclusions resulting from special investigations of individual accidents so that resources for this purpose shall not be wasted by unneeded duplication of investigations.

D. The accident information gathered should be of such a nature and so organized as to be directly applicable in carrying out remedial operational measures.

E. The accident information gathered should be used to evaluate the effectiveness of existing Highway Safety Program Standards as well as for identifying additional desirable standards.

F. The agency responsible for the accident investigation and reporting program shall establish operating relationships between the State government and local jurisdictions to facilitate achievement of the basic program objectives.

G. The accident information gathered shall have a high degree of uniformity and compatability for entry into the traffic records system.

H. In addition to routine basic data collection, States should plan to investigate, from time to time, certain types of accidents in greater detail either by collecting supplementary data of specified kinds for those types of accidents, or by special teams composed of scientists or other specialists with appropriate skills, or by both means. The results of these investigations should be made available to others at least as provided in III 3C above.

I. Multidisciplinary accident investigation teams shall be fielded at State and/or local levels to collect data necessary for planning of effective operational programs.

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V. Police Accident Investigation
VI. Investigation by State Accident Investigation Teams

I. INTRODUCTION

A. The material presented in this chapter provides guidance to the States and their political subdivisions as to the meaning and content of the Accident Investigation and Reporting Standard. *

B. This Volume and the Standard relate to the investigation of motor vehicle traffic accidents and the reporting of information collected.

C. The words "information" and "data" are synonomous for purposes of this Volume, and are used interchangeably.

D. This Standard and Volume do not apply to

1. Other related data collection such as traffic volumes, driver population, and vehicle population.

2. Activities performed in connection with and as a result of the accident but not actually accident investigation, such as directing traffic at the accident scene and emergency services to injured persons.

*See Appendix A.

II. ADMINISTRATION

A. Primary responsibility for the administration of the program should be assigned to a single State governmental agency.* The responsible agency should have the authority to

1. Cause the necessary legislation to be developed and entered into the legislative process,

2. Assign to a State governmental agency (Accident Records Agency) the primary responsibility for the administration and supervision of storing, processing, and providing the motor vehicle traffic accident information needs to user agencies,

3. Develop and promulgate directives to initiate investigations by State accident investigation teams,

4. Provide guidance for obtaining the necessary qualified personnel, equipment, and facilities for accident investigation.

B. Primary responsibility for the administration and supervision of storing, processing, and providing the informational needs to user agencies should be assigned to one State agency (Accident Records Agency). This agency shall be the repository for all motor vehicle traffic accident data for the State. This agency should have the authority to

1. Promulgate and obtain compliance to quality control standards and uniformity of input of accident data,

2. Conduct audits to assure a high degree of compliance to the reporting requirements and quality standards,

3. Design the accident records system to meet the applicable requirements in the Traffic Records Standard.

C. It may be advantageous to have the same agency responsible for "A" and "B" above.

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*If appropriate, this may be the same agency designated under Highway Safety Program Standard No. 10, Traffic Records.

D. Careful study of the "Schematic on Accident Information," Appendix H, provides a framework for operational decisions and for them to be embodied into directives.

E. Information to be reported to the State Accident Records Agency should satisfy the informational needs of the agencies having responsibilities in the highway transportation system. These should include but not be limited to

1. Motor vehicle registration and inspection.

2. Driver licensing and driver education.

3. Financial responsibility.

4. Enforcement (police and courts).

5. Highway environment (engineering).

6. Public health (emergency medical services).

F. The Standard requires that there be adequate numbers of properly trained and qualified personnel at all levels of government having a responsibility for investigating accidents and processing the resulting information. This identifies two primary areas of personnel needs, namely; investigation and data processing.

1. The function of accident investigation should be analyzed in terms of each agency's role.

   a. What tasks and operations are necessary to provide the required information, and what are the qualifications and performance standards of investigators by which competent personnel can be selected and assigned.

   b. Investigative personnel should understand and appreciate the needs of the data processing function and the importance of collecting data in a form suitable for application of statistical and clinical analytical techniques.

c. In the absence of sufficient numbers of qualified personnel, a training program should be initiated for purposes of preparing new entry personnel or of upgrading in-place personnel.

2. The function of data processing should be analyzed in terms of each agency's role and, as above, translated into tasks and operations. Qualified personnel should have an understanding and appreciation of the investigative function. Training may be required to assure competencies of sufficient numbers of data processing personnel.

3. The composition of State accident investigation teams is discussed in Paragraph VI.

4. Adequate equipment and facilities should be provided personnel with which to perform their duties.

   a. Equipment and facilities supporting the investigative function should meet needs for routine continuing data collection and for special data collection. Needs of the investigative function can be generally grouped under

      investigations, field, and follow-up

      recording of information

      vehicle autopsies

      anatomical autopsies

      psychological autopsies

      medical examinations

   b. Equipment and facilities for data processing functions can be generally grouped under entry, storage, analysis, and retrieval.

5. This provision applies equally to those levels of government-State, county, and local-having a responsibility for both investigation of accidents and processing the resulting data.

G. Personnel other than police officers can be used in this program. It may require special skills and knowledge to gather the data needed by the different agencies, thus necessitating either (1) members of that agency to gather the data, or (2) contract with some outside agency to gather the data. However, this does not prevent an agency from negotiating with the police to gather the data needed by that agency either on a regular or sampling basis, provided the police are qualified to gather the required information; i.e., information required by motor vehicle registration, driver education and licensing, financial responsibility, highway environment (engineering), State school bus officials, or public health.

H. Procedures shall be established to assure continuing coordination, cooperation, and exchange of information among local, State, and Federal agencies having responsibility for the investigation of accidents and subsequent processing of resulting data. When appropriate, this shall include interchange of information between local jurisdictions or between States as well as providing for immediate transmittal of data or information between entities within a jurisdiction, such as between a multidisciplinary investigation team and the local highway engineer. Examples of areas where such procedures shall be established are

1. Notification by police to the State Accident Records Agency and/or other agency(ies) fielding an investigator(s) advising of the occurrence of an accident that is of interest to them.

2. Timely notification by the State Accident Records Agency or police to the Federal agency of the occurrence of an accident that is of interest to them. Federal agencies having an interest are

   a. National Highway Traffic Safety Administration–all fatal crashes and all crashes where a contributing factor was due to faulty design or assembly of the motor vehicle,

   b. National Transportation Safety Board–those accidents that are catastrophic in magnitude, of general public interest, involve questions of broad national interest, or which may involve unique technical problems.

c. Federal Highway Administration, Bureau of Motor Carrier Safety–those accidents involving interstate motor carrier vehicles.

d. Those agencies in which a motor vehicle in their fleet is involved.

3. Notification by the State Accident Records Agency to the

a. Highway department(s) of the occurrence of an accident for updating their accident location files in compliance with Identification and Surveillance of Accident Locations, Standard 9.

b. Driver licensing agency(ies) of the occurrence of an accident for updating their driver history file. This notification should include transmittal of data to the State of residence of nonresident drivers.

c. Motor vehicle agency(ies) of the occurrence of an accident for updating their motor vehicle history file.

d. Other agencies for the purpose of liaison, communication, training, and the provision of technological expertise to any investigative agency requesting it.

I. Accident information reported by the driver/owner, the police, or members of a State investigation team* shall be entered into the Statewide traffic records system. It shall be available to all governmental agencies having a responsibility for safety on the highway. This information shall be provided on a need-to-know basis without unnecessarily disclosing the identity of the individuals involved.

1. Uniform definitions and classifications acceptable to the National Highway Traffic Safety Administration shall be used. Those definitions and classifications currently acceptable to the Administration are found in Appendix I.

*See Chapter IV, 6.

2. A distinction must be made between information which describes a condition, circumstance, or behavior which existed at the time of the accident and that which existed and contributed to the accident. See "Recording" in the "Schematic on Accident Information," Appendix H.

J. Records of an investigation are of two kinds:

1. Basic factual data for statistical and administrative purposes prepared in a form for easy storage in a central records system. Such basic data should be recorded for every traffic accident known to the authorities.

2. Supplementary factual data for enforcement or other legal purposes, results of special investigations of peculiar accidents, and conclusions formed as a result of special investigations. These data are too varied to be recorded in simple standard form and must be recorded as case histories which are studies separately or in small collections rather than as mass statistical data.

K. Crash investigations shall be conducted according to standard procedures and policies developed and promulgated by the State. Every effort shall be made to complete and report all information provided for in the required standard format. Agencies that conduct crash investigations shall regularly review their procedures to ensure compatibility with the State traffic records system.

III. ACCIDENT REPORTING

A. A distinction must be made between the reporting of an accident and the reporting of an investigation of an accident, as well as who reports an accident or an investigation of an accident.

B. The reporting of accidents by the driver/owner, and the reporting of the investigation by police and investigation teams should be done within a reasonable time period. State statutory time limitations should be established and met.

C. It is discretionary with the individual State as to whether a penalty should or should not be assessed for failure to report.

One measure of effectiveness of reporting is the degree of compliance. The State should receive not less than a 90 percent compliance with the reporting requirements by drivers/owners.

IV. OWNER AND DRIVER REPORTS

A. Drivers or owners of motor vehicles involved in crashes that exceed the individual State's reporting threshold are required to either submit a report containing the information enumerated in IV-C of the Standard or immediately notify the police of the jurisdiction in which the accident occurred.

B. It is recommended that the driver(s) or owner(s) of a motor vehicle involved in an accident should not be required to submit a report if the police/team investigates and submits a report of their investigation.

C. A statewide accident report form for driver reporting should be designed together with detailed instructions for its completion. Its use by all persons and agencies should be required. The minimum information for the statewide accident report is identified in Section IV-C of the Standard. A more detailed breakdown of that information is found in Appendix C, "Suggested Minimum Detailed Information on All Driver Reported Motor Vehicle Traffic Accidents."

V. POLICE ACCIDENT INVESTIGATION*

A. When the police have been immediately notified, they shall conduct an investigation of those accidents resulting in

1. Fatal or nonfatal personal injury, or

2. Damage to the extent that any motor vehicle involved cannot be driven under its own power, in its customary manner, without further damage or hazard to itself, to other traffic elements, or to the roadway, and therefore requires towing. State or local policy will dictate if and when the police investigate accidents that result only in

*For a data elements list useful for police reporting, in addition to the information necessary for law enforcement purposes, see Highway Safety Program Manual, Volume 10, Traffic Records, and Volume 15, Police Traffic Services.

property damage to the extent that the motor vehicle can be driven normally and safely away from the accident scene.

B. One purpose of the police investigation is to determine whether or not there was a violation of the law and to provide supporting information to demonstrate that no violation occurred or to prove each element of a traffic law violation which was a contributing cause to the accident. However, the police should also take enforcement action on other criminal and traffic violations coming to their attention during the course of their investigation. In order to do this, the officer must be well grounded in the laws and decisions on search and seizure, and arrest.

C. The investigating officer, at the conclusion of his investigation, may not have the necessary evidence (relevant and admissible) to prove each element of a traffic offense(s) that contributed to the accident. Under these circumstances no arrest would be made or citation issued for the offense(s). However, if the officer has reason to believe that the offense(s) was committed and that it contributed to the accident, he should record the offense(s). The purpose of recording this information is to assist analysts in determining causal factors in motor vehicle crashes.

D. The section and subsection number of the State Code should be used by the investigating officer when recording the offense(s) under "B" and "C" above. The State Code is to be used as a standard. However, local policy may dictate that the officer file charges under local ordinance. Under these conditions local ordinance numbers and offense descriptors may be used on the citation or arrest record even though this necessitates use of a violations exchange code at State level for purposes of analysis and record keeping.

E. The police will discover, during the course of their investigation, factors directly related to accidents and injuries that can be attributed to human behavior or condition, motor vehicle design, highway construction and maintenance, or highway conditions. These factors should be recorded by the officer and reported to the appropriate governmental agency

having jurisdiction over the matter.* Information on the use of safety equipment can be gathered on a need and sampling basis.

F. The police report should indicate the condition of drivers in relation to impairment by alcohol or other drugs, and the blood alcohol concentration (BAC), if determined.

G. The accident investigator, in addition to making the "police report" on fatal and injury accidents, should obtain supplementary factual data such as an after-accident situation map, measurements for grades, sight distances, view obstructions, examination of lamps, tires, and other vehicle parts, as well as simple speed estimates from tire marks, photographs of the accident scene, and vehicle damage. An accurate record must be made of injuries resulting from the crash. Further guidance on police reporting of accident investigations is found in Volume 10, Traffic Records, and Volume 15, Police Traffic Services.

H. The official reports of police investigators should be reviewed by supervisors before transmittal to the central records agency to assure completeness, accuracy, legibility, and compliance with provisions for supplementary data in accidents requiring such data.

VI. INVESTIGATION BY STATE ACCIDENT INVESTIGATION TEAMS

A. "State" as used in this context means the geographic area of the State and as a political entity which includes State and local political subdivisions. It does not mean State government exclusively.

B. A team consists of two or more persons representing different interest areas, such as police, traffic engineer, highway engineer, automotive engineer, lawyer, medical, behavioral or social scientist. Teams should be organized for a specific purpose and generally for a specified time period. A team will generally consist of at least a police officer and traffic

*See Appendix G.

engineer, or highway engineer, or automotive engineer, or lawyer, or physician, or psychiatrist, or psychologist, or eye specialist, or sociologist, or any combination. A useful guide for team membership is to have persons representing at least the three major elements of the Program Matrix; i.e., driver, vehicle, and environment. Members of the team may be employed by State or local government, private industry, or be self-employed. The latter two may be on a contract basis to a governmental agency.

C. A team(s) will be formed and the identification of skills/knowledge needed–composition of team–will be made by constant analysis of accident data. Selection of crashes to be investigated will be based on the following criteria:

1. Locations that have a similarity of design, traffic engineering characteristics, or environmental conditions, and that have a significantly large or disproportionate number of accidents or a high accident rate. The following will have to be identified:

   a. Accident locations with similarity of design and traffic engineering characteristics, and

   b. The number of accidents and/or accident rate at a location which is considered to be a significantly large or disproportionate number.

2. Motor vehicles or motor vehicle parts that are involved in a significantly large or disproportionate number of accidents or injury-producing accidents. The following will have to be identified:

   a. The number of motor vehicles registered, by make and model, and

   b. The number of accidents or injury producing accidents by motor vehicle make and model, which is considered to be a significantly large or disproportionate number.

3. Drivers/pedestrians/vehicle occupants of an age group, sex, or other grouping that have a significantly large or disproportionate number of motor vehicle traffic

accidents or injuries. The following will have to be identified:

a. The number of drivers/pedestrians/vehicle occupants of an age group, sex, or other grouping, and

b. The number of involved drivers/pedestrians/vehicle occupants of an age group, sex, or other grouping which is considered to be a significantly large or disproportionate number.

4. Accidents in which there is great discrepancy between property damage and injury, or which are not readily explainable in terms of conditions, circumstances, or causes.

D. Each member of the team should gather data consistent with the mission of the member's agency or area of expertise, and for the purpose of determining probable causes of motor vehicle traffic crashes, injuries, and deaths.

E. There should be a clear definition of each team member's responsibility for the gathering of information. The responsibility embraces one of the following:

1. To gather and record only what he perceives and is told to gather, or

2. To gather and record what he perceives and, in addition, to make judgments, inferences, form opinions, and make recommendations; go beyond what he has been told to gather and record, and record his impressions, opinions, and recommendations.

F. Teams should investigate an appropriate sampling of crashes which meet any one of the criteria mentioned in "C" above, and for special studies to determine quality of standards.

G. Teams should be deployed by time (hour of day and day of week) and location to make full use of their availability.

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II. Purpose of Evaluation
III. Program Evaluation Criteria

I. INTRODUCTION

A. Paragraph V of the Accident Investigation and Reporting Standard requires that the State annually evaluate its accident investigation program and that the National Highway Traffic Safety Administration shall be provided with a copy of the evaluation.

B. The purpose of this requirement is to determine the effectiveness of the administration and operation of the Standard, and the State's compliance with it.

C. This chapter presents evaluation guidelines to assist the State in evaluating its program and to assist local jurisdictions in reviewing their operational performance.

II. PURPOSE OF EVALUATION

A. Program evaluation is an essential ingredient of a well-managed program. It provides the necessary feedback to the manager to inform him of how effective previously made planning decisions are. Continuous evaluation is the necessary means for ensuring that

1. The intent of the Standard is being realized.

2. The program is achieving its stated objectives.

3. There is sufficient and proper allocation of resources.

4. There is a planned and orderly change in response to changes in user requirements, technological capabilities, changing concepts and objectives, and other developments influencing the success of the program.

B. Various levels of evaluation should be included. State agencies and political subdivisions (county/city) should be included in these levels to determine trends that may require new policies, new operating procedures, or new techniques in data collection, transmission, process, and use.

III. PROGRAM EVALUATION CRITERIA

The component parts of a program are objectives, administration, and resources. The components can and should be subject to evaluation. A checklist for evaluating how well the requirements of the Standard and the recommendations of this Volume are being met can be used by the Governor's Representative/program manager. Appendix J is an example of such a checklist.

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II. Operational Reports
III. Management Information Reports
IV. Reports to the National Highway Traffic Safety Administration

I. INTRODUCTION

Program development and operation require the establishment of appropriate means of communicating program activity, performance, and status. The form, content, detail, and frequency of reports are dictated by the recipient. The purpose of this chapter is to outline the various types of reports associated with the State accident investigation program.

II. OPERATIONAL REPORTS

Reports the State agency should receive from local jurisdictions should consist of summaries of the findings, conclusions, and recommendations included in reports of accidents which they investigated.

III. MANAGEMENT INFORMATION REPORTS

A. Management information reports should summarize program activity, performance, and status. Content of the reports should support the concepts of "Management by Objective" and "Management by Exception." (Defined in Appendix B.)

B. The following are examples of basic information that should be reported on a prior period, current period, and forecast:

1. Personnel, for each agency and team

a. Number required to satisfy the function

b. Number presently in place and qualified

c. Number of additional persons needed

d. Number (of "c" above) planned to complete basic training or training to upgrade present qualifications

e. Number of hours spent on field investigations

f. Number of crashes investigated

g. Hourly salary rate for investigators

2. Equipment

a. Investigative equipment acquired and hours of use

b. Cost of equipment

3. Facilities

a. Type of facilities acquired for each interest area

b. Cost of facilities

c. Amount of square feet available for administrative and operational purposes

4. Operational

a. Number of accidents which occurred

b. Number of accidents which occurred of interest to each interest area

c. Number and type of positive actions taken by each interest area

IV. REPORTS TO THE NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

Paragraph V of the Standard requires a copy of the report of the State's evaluation of the program be provided to the National

Highway Traffic Safety Administration. The information should be similar to that found in the checklist contained in Appendix J of this volume and the management information reports described in this chapter.

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II. Local Agencies With Program Responsibilities
III. Description of Activities
IV. Coordination

I. INTRODUCTION

Planning and administration of a statewide accident investigation and reporting program must involve the active participation of local governments since many program operations must be conducted at the local level.

II. LOCAL AGENCIES WITH PROGRAM RESPONSIBILITIES

The following local governmental elements should be involved to some extent in the statewide accident investigation program:

A. Law enforcement agencies

B. Medical examiners or qualified coroners

C. Health agencies

D. Lawmaking bodies

E. Highway and traffic engineers

F. Motor vehicle inspectors

G. Local education and training institutions

III. DESCRIPTION OF ACTIVITIES

A. Law enforcement officers acting in the capacity of motor vehicle crash investigators have the responsibility to respond to traffic accidents for the purpose of detecting and apprehending traffic law violators; rendering emergency medical care and arranging for transportation of persons needing medical aid; protecting property from theft or further destruction; establishing emergency traffic flow patterns; supervising debris removal and clean-up; collecting and reporting driver, vehicle, highway, environmental, and emergency medical services data for input into the State traffic records system.

B. Medical examiners and qualified coroners should gather information about the physical condition, nature, anatomical location, and extent of fatal injuries to people involved, and related injury information necessary to determining injury causation.

C. Health agencies should gather information about the physical condition, nature, anatomical location, and extent of nonfatal injuries to people involved and relate injury information to injury causation. In addition to the physical condition, information on the mental condition of the persons involved should be gathered and related to accident causation.

D. Lawmaking bodies should pass necessary legislation relating to reporting of accidents, disclosure of information about circumstances and conditions of the accident, confidentiality of disclosed information, and unsafe condition or behavior.

E. Highway and traffic engineers should gather information about highway conditions, roadside hazards and environment, design, and traffic control devices at accident locations, and relate that information to accident causation and severity.

F. Motor vehicle inspectors should gather information about vehicle conditions and design characteristics of vehicles involved in accidents and relate them to accident causation and severity.

IV. COORDINATION

There should be a mechanism established to achieve a high degree of coordination between the several agencies needing and gathering information relating to accidents. Two compelling reasons for this are to

A. Assure that the necessary information is being gathered in sufficient quantity and that it is of good quality.

B. Minimize inconvenience to the people involved.

APPENDIX A

HIGHWAY SAFETY PROGRAM STANDARD 18

ACCIDENT INVESTIGATION AND REPORTING

SCOPE

This standard establishes minimum requirements for a State highway safety program for accident investigation and reporting.

PURPOSE

The purpose of this standard is to establish a uniform, comprehensive motor vehicle traffic accident investigation program for gathering information–who, what, when, where, why, and how–on motor vehicle traffic accidents and associated deaths, injuries, and property damage, and entering the information into the traffic records system for use in planning, evaluating, and furthering highway safety program goals.

DEFINITIONS

For the purpose of this standard the following definitions apply:

A. Accident–an unintended event resulting in injury or damage, involving one or more motor vehicles on a highway that is publicly maintained and open to the public for vehicular travel.

B. Highway–the entire width between the boundary lines of every way publicly maintained when any part thereof is open to the use of the public for purposes of vehicular travel.

C. Motor vehicle–any vehicle driven or drawn by mechanical power manufactured primarily for use on the public streets, roads, and highways, except any vehilce operated exclusively on a rail or rails.

REQUIREMENTS

Each State, in cooperation with its political subdivisions, shall have an accident investigation program meeting the requirements established herein.

A. Administration

1. There shall be a State agency having primary responsibility for administration and supervision of storing and processing accident information, and providing information needed by user agencies.

2. There shall be employed at all levels of government adequate numbers of personnel, properly trained and qualified, to conduct accident investigations and process the resulting information.

3. Nothing in this standard shall preclude the use of personnel other than police officers in carrying out the requirements of this standard in accordance with laws and policies established by State and/or local governments.

4. Procedures shall be established to assure coordination, cooperation, and exchange of information among local, State, and Federal agencies having responsibility for the investigation of accidents and subsequent processing of resulting data.

5. Each State shall establish procedures for entering accident information into the statewide traffic records system established pursuant to Highway Safety Program Standard No. 10, Traffic Records, and for assuring uniformity and compatibility of this data with the requirements of the system, including as a minimum

   a. Use of uniform definitions and classifications acceptable to the National Highway Traffic Safety Administration and identified in the Highway Safety Program Manual.

   b. A standard format for input of data into the statewide traffic records system.

   c. Entry into the statewide traffic records system of information gathered and submitted to the responsible State agency.

B. Accident Reporting

Each State shall establish procedures which require the reporting of accidents to the responsible State agency within a reasonable time after occurrence.

C. Owner and Driver Reports

1. In accidents involving only property damage, where the vehicle can be normally and safely driven away from the scene, the drivers or owners of vehicles involved shall be required to submit a written report consistent with State reporting requirements, to the responsible State agency. A vehicle shall be considered capable of being normally and safely driven if it does not require towing and can be operated under its own power, in its customary manner, without further damage or hazard to itself, other traffic elements, or the roadway. Each report so submitted shall include, as a minimum, the following information relating to the accident:

   a. Location

   b. Time

   c. Identification of driver(s)

   d. Identification of pedestrian(s), passenger(s), or pedal-cyclist(s)

   e. Identification of vehicle(s)

   f. Direction of travel of each unit

   g. Other property involved

   h. Environmental conditions existing at the time of the accident

   i. A narrative description of the events and circumstances leading up to the time of impact, and immediately after impact

2. In all other accidents, the drivers or owners of motor vehicles involved shall be required to immediately notify the police of the jurisdiction in which the accident occurred. This includes, but is not limited to, accidents involving (1) fatal or nonfatal personal injury, or (2) damage to the extent that any motor vehicle involved cannot be driven under its own power, in its customary manner, without further damage or hazard to itself, other traffic elements, or the roadway, and therefore requires towing.

D. Accident Investigation

Each State shall establish a plan for accident investigation and reporting which shall meet the following criteria:

1. Police investigation shall be conducted of all accidents as identified in section IV. C. 2 above. Information gathered shall be consistent with the police mission of detecting and apprehending law violators, and shall include, as a minimum, the following:

   a. Violation(s), if any occurred, cited by section and subsection, numbers and titles of the State code, that (1) contributed to the accident where the investigating officer has reason to believe that violations were committed regardless of whether the officer has sufficient evidence to prove the violation(s); and (2) for which the driver was arrested or cited.

   b. Information necessary to prove each of the elements of the offense(s) for which the driver was arrested or cited.

   c. Information, collected in accordance with the program established under Highway Safety Program Standard No. 15, Police Traffic Services, section I-D, relating to human, vehicular, and highway factors causing individual accidents, injuries, and deaths, including failure to use safety belts.

2. Accident investigation teams shall be established, representing different interest areas, such as police, traffic, highway and automotive engineering, medical, behavioral, and social sciences. Data gathered by each member of

the investigation team should be consistent with the mission of the member's agency, and should be for the purpose of determining probable causes of accidents, injuries, and deaths. These teams shall conduct investigations of an appropriate sampling of accidents in which there were one or more of the following conditions:

a. Locations that have a similarity of design, traffic engineering characteristics, or environmental conditions, and that have a significantly large or disproportionate number of accidents.

b. Motor vehicles or motor vehicle parts that are involved in a significantly large or disproportionate number of accidents or injury-producing accidents.

c. Drivers, pedestrians, and vehicle occupants of a particular age, sex, or other grouping, who are involved in a significantly large or disproportionate number of motor vehicle traffic accidents or injuries.

d. Accidents in which causation or the resulting injuries and property damage are not readily explainable in terms of conditions or circumstances that prevailed.

e. Other factors that concern State and national emphasis programs.

EVALUATION

The program shall be evaluated at least annually by the State. Substance of the evaluation report shall be guided by Chapter V of the Highway Safety Program Manual. The National Highway Traffic Safety Administration shall be provided with a copy of the evaluation report.

APPENDIX B

GLOSSARY OF DEFINITIONS

This glossary defines those terms whose meanings may be unclear in the context in which they are used. These definitions are meant to apply only to the usage of these terms in this volume.

Accident - Any unintended event resulting in injury or damage involving one or more motor vehicles on a highway that is publicly maintained and open to the public for vehicular travel. Accident is synonymous with collision or crash.

Accident Causes - A combination of simultaneous and sequential circumstances without any one of which the accident could not have happened.

Accident Investigation - A detailed systematic search to uncover facts and determine the truth of the factors (who, what, when, where, why, and how) of accidents and their relationship to one another.

Accident Reporting - The process of collecting, preparing, and submitting information concerning a traffic accident to a designated agency by the owner, operator, or accident investigator.

Highway - The entire width between the boundary lines of every way publicly maintained when any part thereof is open to the public for purposes of vehicular travel.

Injury - Any bodily harm received by any person in a motor vehicle traffic accident. An injury can be fatal or nonfatal. (See AMA Abbreviated Injury Scale and Manual on Classification of Motor Vehicle Traffic Accidents, Appendix I.)

Management by Exception - A system of identification and communication that signals the manager when his attention is needed (a deviation from the norm) and his response to it; conversely, it remains silent when his attention is not required.

Management by Objective - A system of identification and communication of objectives whereby the manager directs his available resources to the achievement of well-defined objectives.

Motor Vehicle - Any vehicle driven or drawn by mechanical power manufactured primarily for use on the public streets, roads, and highways, except any vehicle operated exclusively on a rail or rails.

Police Traffic Accident Investigation - Traffic accident investigation performed by the police for the purpose of gathering information which will support a charge of a traffic violation which was a contributing factor to the accident and placing such charge against the alleged violator. This does not include activities, such as directing traffic at the scene, providing emergency services to prevent additional injury, damage, or loss, and supervising the debris removal and cleanup; however, the police may perform one or all activities.

Program - An organized, directed effort of resources of the State and its political subdivisions to achieve the objectives set forth in Chapter I of this Manual.

Property Damage - A loss suffered by a person, firm, corporation, institution, or other entity when belongings are marred, defaced, spoiled, ruined, or destroyed.

Record - Any paper, photograph, book, photographic film, sound recording, drawing, map, or other documents of any physical form or character whatever, or any copy thereof, that has been made by an entity or received by it in connection with the transaction of business that give evidence of activities of the entity.

Resources - A collection of personnel, equipment, facilities, and time.

Road - That part of a trafficway which includes both the roadway and any shoulder alongside the roadway.

State - Any one of the 50 States, the District of Columbia, or Puerto Rico.

State Investigation Team - Two or more persons from different interest areas acting in concert while investigating a motor vehicle traffic accident. The persons may individually represent State, county, or municipal government agencies. No distinction is made as to what level of government they represent.

Traffic Records System - The personnel, equipment, facilities, information, and procedures necessary to correlate collision data with vehicle, driver, and/or highway data to

A. Identify primary causative factors of highway collisions.

B. Identify significant trends in highway collisions and their causes.

C. Evaluate new programs or techniques for the prevention of highway collisions.

D. Determine those areas where further emphasis, research, and development are required to reduce highway fatalities, injuries, and damages.

APPENDIX C

SUGGESTED MINIMUM DETAILED INFORMATION ON ALL DRIVER REPORTED MOTOR VEHICLE TRAFFIC ACCIDENTS*

1. Identification of location

   Name of State

   Name of city/county

   Name and number of highway or street on which accident occurred

   Name and number of intersecting highway, street, or railroad; or if not intersection, the distance, direction, and identification of the closest intersecting street or specific highway landmark or reference**

2. Time

   Hour of accident occurrence

   Day of week of accident occurrence

   Date, month, and year of accident occurrence

3. Identification of driver(s)

   Name–last, first, middle

   Address–house number, street, city, State

   Sex

   Date of birth

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*For a data elements list useful for police reporting, in addition to the information necessary for law enforcement purposes, see Highway Safety Program Manual, Volume 10, Traffic Records, and Volume 15, Police Traffic Services.

**Volume 9, Highway Safety Program Manual.

License

Type

Restrictions

Issuing State

Number

4. Identification of pedestrian(s)/vehicle occupant(s)/pedalcyclist(s)

Name-last, first, middle initial

Address-house number, street, city, State

Sex

Age

Location in vehicle (seating arrangement)

5. Identification of vehicle(s)

Make

Model year

Body type

Model name

Identification number (V. I. N.)

Registration

Owner's name-last, first, middle

Owner's address-house number, street, city, State

Number

Issuing State

Year of issue

Odometer reading

Damage area(s)

Description–location and extent of damage

Direction of force

6. Direction of travel of each unit

7. Other property involved

Description–name of object, location, and extent of damage

8. Environmental conditions existing

Road

Alignment (each vehicle)

Surface conditions (each vehicle)

Weather and light conditions

Traffic control devices–existing and functioning (each vehicle)

9. A narrative description of the events and circumstances having a relationship and leading up to the time of impact and immediately after impact. It is of particular importance that all unusual events or actions be recorded, such as "trying to pick up a cigarette that dropped."

10. A diagram of the accident scene which shows the path of the vehicle(s) before the accident; position of the vehicle(s) at time of impact, and after the accident; and pertinent physical features.

APPENDIX D

REFERENCES

The following is a selected list of recognized authoritative references which may be helpful in implementing the programs specified in this volume. This list is not meant to be a bibliography of all documents available in this field.

AASHO Highway Definitions (1968). American Association of State Highway Officials, 341 National Press Building, Washington, D.C. 20004.

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Cornell Aeronautical Laboratory, Inc., Development of Improved Methods for Reduction of Traffic Accidents, Part I and II (1968). Prepared for Highway Research Board, National Research Council, National Academy of Sciences, National Academy of Engineering by Cornell Aeronautical Laboratory, Inc., Buffalo, New York 14221.

Cornell Aeronautical Laboratory, Inc., Proceedings of the Collision Investigation Methodology Symposium (1969). Prepared for the U. S. Department of Transportation, NHSB, and the Automobile Manufacturers Association.

International Assocation of Chiefs of Police, Highway Safety Policies for Police Executives, International Association of Chiefs of Police, Inc., 11 Firstfield Road, Gaithersburg, Maryland 20760.

National Safety Council, Manual on Classification of Motor Vehicle Traffic Accidents (1970), National Safety Council, 425 North Michigan Avenue, Chicago, Illinois 60611.

Uniform Vehicle Code (1968), National Committee on Uniform Traffic Laws and Ordinances, 1776 Massachusetts Avenue, N. W., Washington, D. C. 20036.

APPENDIX E

REPRESENTATIVE PROJECTS

The State may wish to evaluate the undertaking of special projects which will lead to developing alternative methods of accomplishing the purposes of the Accident Investigation and Reporting Standard, as, for example

1. Establish and staff facilities to perform motor vehicle autopsies. Such centers could also be used to carry out the State's motor vehicle inspection program.

2. Establish and staff facilities to perform psychological autopsies. Such centers could be located in conjunction with Department of Mental Health facilities.

3. Determine minimum manpower requirements for investigation and for data processing in each State agency and in each local agency. Conduct a skills inventory of in-place personnel. Define unmet manpower requirements and establish personnel requirements.

4. Inventory local, State, regional, and national training resources; facilities, faculties, equipment, and curriculum materials.

5. Assign personnel to existing training facilities. Define requirements for additional and different local, State, regional, or national training resources.

6. Establish and staff facilities to perform anatomical autopsies and chemical analysis of bodily substances.

7. Research into using technological advances in gathering, recording, and transmitting accident information.

APPENDIX F

RESOURCE ORGANIZATIONS

The following organizations can provide information and assistance related to accident investigation:

American Association of Motor Vehicle Administrators
1828 L Street, N. W.
Washington, D. C. 20036

American Association of State Highway and Transportation Officials
341 National Press Building
Washington, D. C. 20006

Institute of Traffic Engineers
1815 N. Fort Myer Drive
P. O. Box 9234
Arlington, Virginia 22209

International Association of Chiefs of Police
11 Firstfield Road
Gaithersburg, Maryland 20760

Motor Vehicle Manufacturers Association of the U. S., Inc.
320 New Center Building
Detroit, Michigan 48202

National Committee on Uniform Traffic Laws and Ordinances
1776 Massachusetts Avenue, N. W.
Washington, D. C. 20036

National Safety Council
425 N. Michigan Avenue
Chicago, Illinois 60611

Society of Automotive Engineers
18121 East Eight Mile Road
Detroit, Michigan 48236

Northwestern University Traffic Institute
405 Church Street
Evanston, Illinois 60204

APPENDIX G

CAUSES AND CONTRIBUTING FACTORS

I. This material is presented to illustrate the environment in which accident investigation existed and exists and the evaluation and interpretation of the "cause concept." It should be borne in mind that these are selected quotations to illustrate this evaluation and that the conditions, thinking, and philosophy which existed then may not necessarily exist today.

A. The concept of "causes" is sometimes controversial and often receives varying interpretations.

B. Blumenthal and Wuerdemann (1) state that "the present confusion in the usage of the term derives from

1. the belief that every event has a single cause

2. the belief that infractions of the legal code are causes of accidents

3. the belief that fault and cause are synonymous in explaining an accident."

C. Baker (2) states that

"It has been customary to name a single factor as 'cause of the accident.' Even people who recognize that nearly all accidents have more than one factor may urge us to report only 'the most important' factor for the accident. But how can we do this if we define a factor as a circumstance that is necessary if the accident is to happen? Naming a single factor as most important would be like trying to pick out the most important link in a chain or the most important leg on a chair. Some may be more conspicuous, but all are equally necessary. It is thus meaningless to try to designate some factors as 'primary' and some as 'secondary.'"

The report on the State of the Art of Traffic Safety (3) concludes that

"Often in the literature one finds the statement that an accident was caused by some factor, for example, skidding . . . the term 'cause' is a major source of confusion since it implies a single cause, a concept which we believe is not meaningful in most traffic accidents since they usually result from a combination of human, vehicle, and environmental factors."

D. Ribicoff (4) points out that

"We once assumed that every accident was caused by a failure on the part of the driver. But now we see that accidents are caused by the car, the road, and the driver–by themselves or in any combination.

"Imagine a car traveling along a road. A flash of sunlight reflected off the windshield wiper blinds the driver momentarily. One can argue that the car is at fault. But the driver is going too fast. So, dazzled by the glare, he can't react quickly enough and the car swerves to the right onto the shoulder of the road. The driver too is at fault.

"The shoulder of the road is soft and muddy. It catches the wheel and throws the car into a telephone pole, set too close to the highway. The road itself is at fault. Thus in one accident, we can see all three factors at work–the car, the driver, and the road. All three share the blame. But the analysis is not complete.

"Let us assume that the driver in this case–as in so many others–was killed or injured. It wasn't the soft shoulder or the telephone pole. It was more likely the crushing impact of his body against the steering wheel–or the result of his head striking the dashboard."

II. Some are confused in believing that traffic violations are causes of accidents, when some police traffic accident reports and statistical summaries derived therefrom describe or label violations as "contributing factors." The confusion is also perpetuated by Section 10-113 of the Uniform Vehicle Code (5) which states: "(a) The department shall prepare and upon request supply to police departments, sheriffs, and other appropriate agencies or individuals, forms for written accident reports as required in this chapter and in Chapter VII, suitable with respect to the persons required to make such reports and the purposes to be

served. The written reports shall call for sufficiently detailed information to disclose with reference to a vehicle accident the cause, conditions then existing, and the persons and vehicles involved.

"(b) Every accident report required to be made in writing shall be made on the appropriate form approved by the department and shall contain all the information required therein unless not available. (SECTION REVISED, 1962)."

III. It is not generally recognized that the police do not have a legal responsibility for determining accident causation. According to R. D. Smith (6) of the International Association of Chiefs of Police, "the central purpose of accident investigation must, from the police administrator's view, remain first the presentation of persons accused of law violations and pertinent evidence to an appropriate public court of adjudication, and secondly, the continuous development of pertinent data relating to vehicle accidents for use by the police administrator, traffic engineer, licensing officials and highway officials in decision making. Any other objective is spurious."

IV. Another source of confusion stems from the failure to distinguish between culpability as legally defined and "cause." A civil court of law adjudicates issues of culpability, negligence, and responsibility—as defined by civil law—and not causation.

V. Baker (2) defines cause as

". . . the combination of factors . . . a factor is any circumstance connected with a traffic accident without which the accident could not have occurred.

"If a factor cannot by itself produce an accident it should not be considered a cause. A true cause will produce the result, in this case a traffic accident, every time. Therefore, cause is defined as a combination of simultaneous and sequential circumstances without any one of which the accident could not have happened. A combination of circumstances or factors which is sufficient to cause an accident would always cause an accident. In this combination each factor is necessary but is not sufficient by itself to cause an accident.

"Simultaneous factors are those which must be present at the same time to cause an accident. Usually two are paired, but there may be more than that. Often matched pairs involve a factor in one traffic element, the road, for example, and a corresponding factor in another element, for example, the driver.

"Sequential factors recognize different levels of remoteness from the crucial event of the accident. Certain actions or conditions are factors which set up situations that increase the subsequent probability of an accident. Thus there is a sequence of possible factors from one level to the next."

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5. National Committee on Uniform Traffic Laws and Ordinances, Uniform Vehicle Code (1968), National Committee on Uniform Traffic Laws and Ordinances, Washington, D.C.

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APPENDIX H

PROGRAM MATRIX FOR HIGHWAY SAFETY RESEARCH

Highway safety research is being conducted in many areas of the various disciplines. The National Highway Traffic Safety Administration developed a matrix which logically categorizes specific areas of study. These areas of study concern the vehicular movement of people and goods from one place to another as efficiently, quickly, economically, and safely as possible. Basically, highway safety is concerned with preventing mishaps during these movements. Mishaps involve humans (drivers, passengers, pedestrians), motor vehicles, and the environment (including ambience and the highways). The bulk of mishaps under study involve collisions or crashes. Phases of crashes which demand research include precrash factors, crash factors, and postcrash factors. Thus a program matrix for highway safety research has evolved to meet these concerns, and appears below:

	Precrash	Crash	Postcrash
Human	1	2	3
Vehicle	4	5	6
Environment	7	8	9

This matrix has been numbered for convenience and the specific matrix cells defined and explained for categorization purposes.

1. HUMAN-PRECRASH

The first matrix cell is concerned with human factors prior to the crash that contribute in some manner to the actual occurrence of the collision. These contributing factors may be related to the drivers, the passengers, and/or the pedestrians involved in the collision. Any acute physical breakdowns, such as heart failure, falling asleep, etc., that would essentially place the driver "out of the system" would be considered critical factors. Nonperformances by the human which may have contributed to

the crash singly or in conjunction with other factors would include slowed reactions, driver decisions, inattentiveness, misjudgments, errors, improper maneuvers, etc. States or conditions the participants were in at the time of the collision may also be factors. These include intoxication, inexperience, fatigue, emotional factors, etc. In summary, cell 1 includes any human factors which may have, in some manner, contributed to the collision occurrence.

2. HUMAN-CRASH

Cell 2 refers to the human actions which occur essentially during the few seconds of vehicle impact with the environment, another vehicle, or a pedestrian. Any factors related to human tolerance, occupant kinematics, and occupant restraint which are related to the reduction of injuries that occur during the crash stage would apply in this cell. Examples include occupants not using available seat belts or shoulder harnesses, helmet protection on motorcycle drivers, improper seating of passengers, occupant behavior during impact (i.e., bracing, sleeping, in panicked state), an injury comparison between ejections and vehicle interior contacts.

Basically, this cell pertains to human factors related to injury causation, prevention, and/or attenuation.

3. HUMAN-POSTCRASH

This cell relates to any postcrash factors dealing with the egress of victims, first aid, ambulance services, impeding human behavior, etc., that may affect collision victim assistance. Occupant removal, treatment at the scene, travel to the hospital, and any resultant injuries are all examples of human postcrash factors. The education of passengers on the location and use of existent emergency exits on commercial vehicles would also refer to this cell.

4. VEHICLE-PRECRASH

This initial cell related to the vehicle is associated with those factors of the vehicle itself which may have contributed to the collision occurrence. Any functions of the vehicle which do not perform properly, fail, confuse the driver, or in any manner contribute to the collision would be included as a precrash vehicle factor. Inadequate design (both dynamic and driver-related),

vehicle control alterations (modifications, special controls, etc.), vehicle handling and stability, nonstandardization, driver incompatibility, and negligent or improper inspection and/or maintenance are also factors which could contribute to a collision occurrence.

In summary, any factors related to the functional performance of the vehicle which are considered contributory to the collision apply to this matrix cell.

5. VEHICLE-CRASH

This cell deals with the vehicle performance under crash conditions. Any vehicle-related elements of the system which are associated with occupant injuries or damage causation during the impact stages of the collision apply. Examples of vehicle factors in this cell include areas of vehicle kinematics, energy management, damage patterns, recommended designs or reinforcements, vulnerable areas of injury causation, new innovations or suggestions related to injury prevention or attenuation, new safety features which did (or did not) perform their intended functions, etc.

Basically, this phase is concerned with the vehicle role in the "second collision," structural performance, and recommendations for improvement.

6. VEHICLE-POSTCRASH

Postcrash occurrences producing additional injuries or damages which can be attributed to the vehicle would be included in this cell. Postcrash fires, ruptured fuel lines, inadequate exits, and the existence of first aid and extrication kits are examples of vehicle-related elements. Also, the removal of damaged vehicles by towing services and any related delays or damages would refer to this cell.

7. ENVIRONMENT-PRECRASH

The environment is naturally divided into two parts, (1) the highway, a more or less static element, and (2) ambience, the temporary, dynamic elements of the environment. This cell is concerned with those environmental elements which may have contributed to the collision occurrence-including highway condition, design and maintenance, and ambient conditions. These include factors which reduce the driver's efficiency in the control and

speed of his vehicle, or reduce normal vehicle functions which could be critical to the collision. Examples of precrash highway factors include view obstructions, control hindrances, malfunctioning or incorrectly designed signals, inadequate road design, and negligent maintenance. Ambient factors might involve adverse weather conditions, slick roads, vision limitations, view obstructions, and hazards. More subtly, highway designs which do not adequately forewarn the driver, or confuse him, could also be environmental contributing factors.

8. ENVIRONMENT–CRASH

Ambient or highway factors which contribute to any damage or injury severities during the impact phase apply to this cell of the matrix. Examples of highway design include inadequate guardrails which do not absorb energy properly or redirect the unit, trees or poles placed too close to the roadway edge, inadequately designed bridge abutments, absence of median barriers, etc. Ambient factors increasing injury severity might be the presence of a parked vehicle struck by an ejected occupant, or temporary construction increasing damages and injury.

9. ENVIRONMENT–POSTCRASH

Postcrash factors pertaining to the general "cleaning up" of the accident scene and measures taken to prevent further mishap would apply in this last matrix cell. Traffic control and direction by the police, adequate warning signals (i.e., flares) of the collision aftermath, the prompt repair of damaged signs, signals, lights, and highway surface, the sweeping up of debris, glass, liquids, etc., would be examples. In general, procedures used in cleaning up the scene caused by the collision and actions taken to prevent further mishaps apply here.

ACCIDENT INFORMATION MATRIX

	Pre-Crash	At Crash	Post-Crash
Human	1	2	3
Vehicle	4	5	6
Environment	7	8	9

SCHEMATIC ON ACCIDENT INFORMATION

Possessing	Gathering	Analyzing	Recording	Processing and Storing
Human Driver Friends Witnesses Doctors Nurses Driver License Registrar Police Business	**Location** At Scene Off Scene	**Location** At Scene Off Scene	**What** Existing But Not Contributing Existing and Contributing	**Paper** Report Forms Machine Tab Cards Non-structured Report Forms
Vehicle Mechanics Witnesses Driver Automotive Eng Police Motor Vehicle Registrar	**Who** Driver Police Engineer Traffic Highway Automotive	**Who** Police Engineers Traffic Highway Automotive	**Media** Paper Structured Report Form Non-structured *	**Tape** Audio Audio-visual Magnetic
Environment Highway Eng Traffic Eng Driver Police Witnesses	**Health** Medical Psychiatrist Psychologist	**Health** Medical Psychiatrist Psychologist	**Tape** Audio Audio-visual	**Film**
	Other	**Other**	**Film**	

* Input Into the Traffic Records System

RELIABILITY FACTS, NONFACTS: Inference, Opinion, Conclusion

APPENDIX I

SOURCES OF UNIFORM DEFINITIONS AND CLASSIFICATIONS

Acceptable to the
National Highway Traffic Safety Administration

1. Manual on Classification of Motor Vehicle Traffic Accidents, American National Standard D16.1-1970.

2. Uniform Vehicle Code, Chapter 1.

3. Medicolegal Autopsy Report, Registry of Accident Pathology, Armed Forces Institute of Pathology.

4. Collision Performance and Injury Report, long form, GM PG2070, General Motors Corporation.

5. Vehicle Damage Scale for Traffic Accident Investigators, TAD Project Technical Bulletin #1.

6. American Medical Association's Abbreviated Injury Scale.

7. Manual on Uniform Traffic Control Devices, FHWA.

8. Vehicle Deformation Index, SAE Recommended Practice J224a.

9. National Crime Information Center - Operating Manual Part II, Sections 7.2, 7.3, 7.4, 7.5.

10. AASHO Highway Definitions.

11. Design Manual for State Traffic Records System, NHTSA.

APPENDIX J

CHECKLIST FOR PROGRAM EVALUATION

I. Planning

A. What specific objectives are planned for accomplishment during the next fiscal year? Over the next two fiscal years?

B. What resources are needed to achieve the objectives as set forth in "A" above?

II. Finance

A. What amount of State/local funds will be available for matching Federal funds?

B. What amount of funds have been included in the State/local budget for the next two fiscal years?

C. Are the available funds sufficient to accomplish the planned, stated objectives identified in "I" above?

III. Operation

A. Are all drivers required by law to submit a report of the motor vehicle traffic accident in which they were involved to the responsible State agency?

B. Are the police notifying each appropriate agency of accidents which meet the agency's criteria for on-scene investigation by the agency's personnel?

C. Is the criteria for on-scene investigations by agency personnel established by a statistical significance or disproportionate number of accidents which have characteristics of interest to the agency? What are the criteria?

D. What percent and number of the accidents identified in "C" above are investigated by the interested agency?

E. Is the main thrust of agency investigations directed toward accident and/or injury causation pertinent to the agency's responsibilities and mission?

F. Has multiagency investigation of accidents achieved a team approach?

G. Are, in fact, the reporting and data requirements being met by all components of the system? What is the degree of compliance?

IV. Legislation

A. Does your law require drivers involved in accidents to report to a State agency?

B. Does your law require drivers involved in accidents to report to the police on injury and tow-away accidents?

C. Does your law require drivers and others to disclose information about accidents to legal representatives of investigative agencies other than police?

D. Does your law protect the confidentiality of information disclosed under "C" above?

V. Administration

A. Are there written procedures on who and when to notify when an accident has been reported to the central agency and are they known to all concerned?

B. Does each agency have sufficient numbers of personnel, assigned to the investigation function? To the data processing function? Are all qualified and competent? Are all adequately equipped to perform?

C. Is training being provided to overcome deficiencies revealed in relation to the paragraph above? What additional or different resources are required: facilities, equipment, instructors, and curriculum development?

D. Are there written directives relating to accident information on who is to record what? On what? And what is to be done with it?

E. Are data items to be gathered on an accident clearly defined in order to achieve a high degree of uniformity of data?

F. Are approved uniform definitions and classifications being used by all agencies gathering accident information?

G. What objectives for the past year have been achieved or have not been achieved, and if not, what were the controlling factors?

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